

**Hydrologic Studies
for
Assured and Adequate Water Supplies
A.R.S. 45-108 and A.R.S. 45-576**

-GUIDELINES-

Arizona Department of Water Resources

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I. INTRODUCTION

A.R.S. §45-577.B. requires that, if groundwater is the proposed source of supply, applicants for certificates of assured water supply shall submit hydrologic studies which demonstrate an assured water supply for the proposed use. The Director of the Arizona Department of Water Resources (ADWR) is authorized to prescribe the contents of hydrologic studies. The assured and adequate water supply rules of 1995 require that applicants submit studies demonstrating that proposed sources of water meet physical availability and quality criteria defined in R12-15-703, 704, 717, and 718. Rules R12-15-703.B.1.b. and R12-15-117.B.1.b. require that studies apply methods of analysis approved by the Director. These guidelines summarize methods of hydrologic analysis and the content of hydrologic studies for assured or adequate water supply demonstrations using groundwater or surface water as the source of supply.

II. PROCEDURES

A. Subdivisions consisting of 20 lots or less.

Hydrologic studies are not required for subdivisions of 20 lots or less, however, developers of subdivisions consisting of 20 lots or less may be requested to drill wells, perform some hydrologic investigations and submit new data or results of field tests to the Hydrology Division for interpretations. It is recommended that the developers of subdivisions of 20 lots or less discuss the scope of such investigations with the Hydrology Division's representative prior to drilling and testing. The Hydrology Division cannot guarantee that the agreed upon scope of an investigation involving well drilling and testing will result in a successful demonstration of an assured or adequate water supply. The burden of demonstration of an assured or adequate water supply is on the developer.

B. Subdivided lands of more than 20 lots.

Hydrologic studies are required for subdivisions consisting of 21 lots or more. The objectives of hydrologic studies are distinctly different for a dry lot subdivision (when lot owners drill their own domestic wells) than for a subdivision served water by a water utility from a central municipal well field.

In the case of a dry lot subdivision, the demand of a single lot is small but groundwater must physically occur underneath each lot and at depths which do not exceed 400 feet below land surface after one hundred years. The emphasis of the hydrologic study must be on demonstration of uninterrupted continuity of the aquifer beneath the entire subdivision. Field tests should be designed to achieve this objective. Short of drilling and testing wells on each lot, well interference tests across two or three lots may prove continuity. Instead of long aquifer tests, short and simple well recovery tests can also demonstrate individual well capacity. Demonstration of one-hundred year continuous groundwater availability for dry lot subdivisions would require evidence of the aquifer's extent beyond the immediate area of the subdivision as well as historic water level records for the source aquifer.

For water utilities, hydrologic studies do not need to relate to the exact area of the subdivision for the source of supply but to the regional aquifer, possibly in an area away from the subdivision. The supply well(s) should be high yielding and the source aquifer must be able to support the cumulative demand of the area for one hundred years with depths to water not exceeding the maximum one-hundred year depth-to-static water level criteria. For the Prescott, Phoenix and Tucson AMAs, the maximum depth-to-static water level is 1000 feet. In the Pinal AMA, the maximum depth-to-static water level is 1100 feet. Outside of AMAs, the maximum one-hundred year depth-to-static water level is 1200 feet.

Aquifer tests for such studies need to be of long duration (from 24-72 hours or longer) and must prove the continuous availability of the supply on a regional scale.

Prior to submitting a hydrologic study, the consultant, on behalf of the developer (or provider), should submit a proposal to perform the study to the ADWR's Hydrology Division for review and comments.

C. Proposal for a hydrologic study

In general, the purpose of the proposal is to outline the available information regarding the water supply of the area, to scope the additional investigations necessary to supplement this information and to propose specific analytical methods for impact quantification. A proposal for a hydrologic study for demonstration of physical availability of a water supply should include, but not be limited to, the following information:

1. Geographic location of the subdivision (descriptive, legal and graphical on a topographic map) showing boundaries of certificated areas of the nearest water utility or municipality; major roads; towns and cities; etc.
2. Geohydrologic location of the subdivision on a hydrologic or geologic map (i.e. ADWR's Hydrologic Map Series reports, U.S.G.S. maps, etc.) showing pertinent hydrologic boundaries, streams, geologic formations and types of sediments which are hosts to aquifers.
3. List of published and unpublished geohydrologic reports for the area of review such as U.S.G.S. papers, ADWR reports, maps, cross-sections, etc.
4. Availability of well information, aquifer test data, aquifer parameters, present water use in the review area and groundwater quality (ambient and potential problems due to contamination).
5. If surface water is the potential source of supply the proposal should define the nature of the stream, lake or spring (perennial or intermittent); the availability of information on historic uses from this source of supply; and the availability of water quality information and potential problems related to seasonal or long-term sources of contamination. Also, the legal availability should be considered.
6. Proposed field investigations, drilling and testing of wells, flow measurements on surface water sources, reading of groundwater levels in wells, sampling for quality

- of groundwater and surface water in order to update and expand the existing information for the area of review as described in items 3, 4 and 5.
7. An estimate of the demand of the subdivision and of the demands which the proposed utility is serving, the general water use within the area of review and the historic response of the source aquifer or stream to the past withdrawals and diversions.
 8. Proposed methods of hydrologic analyses for quantification of the sources of supply and projection of the long-term impact of the demand on the existing supply. Impact analyses should include methods of evaluation of potential on-going surface-groundwater interactions or such which may be triggered by the projected increases of groundwater withdrawals.
 9. General time schedule for the pertinent field investigations, completion and submittal of the study to the Department.

D. Hydrologic study

The purpose of the hydrologic study is to demonstrate physical availability of groundwater or surface water at the applicant's location consistently with criteria defined in R12-15-703, 704, 717, and 718. The study should present only hydrologic information pertinent to the review area. All sources of information used in the study should be identified including basic data collected by the consultant. Basic data for the immediate area of the subdivision must be current, have a date of collection noted and located on a map. The level of technical detail and analysis may vary depending on the geohydrologic conditions of the area.

The study and report should be technical and in the format of spreadsheets, tables, graphs, maps and cross-sections. The study should contain three parts; demand, source of supply and the projected 100-year impact. The following is a description of each:

1. Demand

Correct evaluation of the demand has a direct effect on availability of the supply especially in water-competitive, high-growth areas. The Hydrology Division suggests that review of demands for subdivisions inside of Active Management Areas (AMAs) be shown in the hydrologic study in two ways:

First, the study should show actual water use in the area of the proposed subdivision based on at least three past annual reports by the provider. Actual annual water uses should be expressed as water use per lot, dwelling unit and per capita. The estimated demand of the new subdivision should be based on real (past) water use in the area. Population densities should be reported from the last available census information.

Secondly, inside of the (AMAs), the demand of the subdivision should be projected consistently with water conservation criteria and model demands prescribed by the AMA for the appropriate management plan. The consultant (or developer) should

contact an AMA representative and discuss water conservation issues for the specific subdivision and arrive at a demand for the subdivision consistent with conservation requirements and targets. Subdivisions of 51 lots or more must have water conservation plans prepared in cooperation with the AMA and consistent with R12-15-706.D. Consequently, the demand of the subdivision should be presented in a manner consistent with the water conservation plan and provider-specific conservation criteria.

The two alternative water demands (one based on past actual water uses and the other on prescribed water conservation requirements) should be compared in the study and the higher demand should always be used for simulation of the hydrologic impact on the source aquifer.

Outside of AMAs, hydrologic studies for adequacy reports under A.R.S. §45-108, should present the demand only in a manner consistent with past water use in the specific area. Past water uses per lot, dwelling unit and per capita should be determined on basis of information contained in annual reports by the utilities to the Arizona Corporation Commission (ACC). Providers not regulated by the ACC (municipalities, cooperatives, associations, water districts etc.) should be contacted directly by the applicant or his consultant.

For impact evaluation, the projected demand of the subdivision must always be presented on top of the current and committed demands of the area of review or provider's certificated area (certificate of convenience and necessity, also known as a CC&N, granted by the ACC which allows a private water company to sell and provide water to customers within a designated area). Current demand is the demand of the past year for which an annual report was filed with the AMA or the ACC. Committed demand is the demand of all recorded, but not yet served, lots in the CC&N area. The committed demand should always be updated in subsequent hydrologic studies for the same general area or for the CC&N. The projected demand includes the demand of the new subdivision and other new demands planned in the area of review.

2. Supply

The supply section of the hydrologic study should demonstrate the quantity, quality, continuous availability and legal availability of groundwater or surface water considered by the applicant or his consultant as the source of supply for the new subdivision.

2.1. Groundwater; if groundwater is the source of supply, the study should include but not be limited to the following information:

- a) Location of the subdivision and the water provider (descriptive, legal and

graphical) showing the boundaries of the subdivision, boundaries of the CC&N of the provider, major highways and roads, boundaries of adjacent municipalities, streams, mountains and other important geographic information.

- b) Well inventory map showing wells which will serve the proposed subdivision, other water provider wells, adjacent well fields and other points of groundwater withdrawal within the radius or area pertinent to the objectives of this project. The map should show at least each well's depth to water, date that the water level reading was taken, elevations of the static water level above mean sea level and depth of the well.
- c) Hydrology map showing location of the subdivision and boundaries of the water provider with groundwater contours based on current water level information, directions of groundwater movement, gradients, hydrologic boundaries and areas of natural and artificial recharge, etc.
- d) Geohydrologic cross-sections showing vertical distribution of major aquifer and lithological units penetrated by individual wells, vertical projections of aquifer boundaries, groundwater levels, perched systems, etc.
- e) Spreadsheet showing pertinent well information such as: legal description (location) of wells, well owner's name, ADWR registration number, depth-to-water, date when the water level was measured and by whom, well yield, well specific capacity, and availability of aquifer tests, etc.
- f) Narrative interpretation of area hydrology, hydrologic boundaries, recharge areas, withdrawal areas, aquifer lithology and units, aquifer parameters (how determined), depth to groundwater, area water-level declines (hydrographs), well yields and specific capacities, groundwater quality, potential contamination areas, groundwater movement (velocities, gradients etc), projected impacts of proposed groundwater withdrawals on local aquifer systems.
- g) Appendices containing:
 - well logs, registration forms
 - water level records by wells
 - aquifer tests records
 - laboratory water-quality analysis
 - calculation sheets, computer analyses printouts

2.2. Surface water; if surface water is the source of supply, the study should include, but not be limited to, the following information:

- a) Map showing location of the subdivision and the water provider's certificated area in relation to the nearest boundaries of the watershed and the source stream, lake, spring, etc.
- b) Map showing the specific reach of stream where the diversion will occur, including boundaries of the younger alluvium, existing and proposed points

of diversion, etc.

- c) Cross-section along and perpendicular to the stream (within a reasonable extent upstream and downstream from the point of diversion) showing the younger alluvium, groundwater level in the younger alluvium on both sides of the stream, gradients within the younger alluvium, etc.
- d) Records of flow from the nearest stream gage (preferably one upstream and one downstream), daily and monthly annual flow information, flow frequency curves, stream hydrographs, definition of the nature of the stream (perennial, intermittent), firm supply, water quality information, etc.
- e) Back-up source of supply and hydrologic evidence of availability of such back-up sources. (Possibility of groundwater supplementing surface water during times of deficiency.)
- f) Narrative and analytical demonstration that the surface water will be physically available for the proposed use given short-term and long-term fluctuations (base-flow analysis) due to climatic cycles or other factors such as groundwater diversion.
- g) Evidence of surface water rights consistent with R12-15-703.D.2.

2.3. Water quality; if the project is located within or near an existing or potential groundwater or surface water contamination site, the study must address this issue. The study should describe and assess the source of contamination, outline the remediation program approved by the EPA or DEQ and show analytically how the water supply project may or may not be affected by this contamination. This analysis must be consistent with R12-15-702.A.O. and R12-15-716.A.M.

3. Impact

The purpose of the impact evaluation of the cumulative, current, committed, and projected demands on the sources of groundwater or surface water supply is to show that the supply is available under assured and adequate criteria defined in R12-15-703 and R12-15-717 as well as water quality criteria defined in R12-15-704, R12-15-718, R12-15-702.A.O. and R12-15-716.A.M.

Hydrologic methods acceptable to the ADWR for evaluation of the 100-year impact of the projected demand on the existing supply are:

- a) tank analogy
- b) single well Theis
- c) multiple well Theis
- d) numerical flow models

The Hydrology Division recommends that the selected analytical methods be conservative and that they do not minimize the impact unless there are documented site-specific reasons for choosing less conservative parameters and methods of

evaluation.

It is recommended that reasonable aquifer parameters be applied for the selected analytical methods of impact quantification. It is recommended that within areas covered by numerical flow models generated by the ADWR, consultants use aquifer parameters (hydraulic conductivity and specific yield) from such models, unless there are more site-specific values from aquifer tests or newly drilled wells. If the only source of information available is from driller's logs, the ADWR recommends that specific yield values presented in the USGS Water Supply Paper 1662-D be used. Lower range (more conservative) values should be selected for given sediments unless new and site-specific information indicates otherwise.

Impact of cumulative withdrawals on the source aquifer should always be projected from existing service area wells (R12-15-703.A.B.1.) by adding new demands to the current withdrawals. Future wells are acceptable for impact evaluation only if the new development is planned to be served water by a new provider which has yet to be formed and there is no existing service area to serve this development, or extensions of lines from the existing service area to the new development are economically prohibitive.

R12-15-702 Assured Water Supply Requirement-Application for Certificate of Assured Water Supply; Application for Designation of Assured Water Supply; Application for Analysis of Assured Water Supply

- A. A person applying for a certificate of assured water supply, a designation of assured water supply or an analysis of assured water supply shall provide the following information on a form prescribed by the director:
1. For an application for a certificate of assured water supply or an analysis of assured water supply:
 - a. Name and address of the certificate applicant or AAWS applicant.
 - b. Name of the proposed development.
 - c. Name, address and telephone number of the municipal provider proposed to serve the development, the owner of the proposed development, and the applicant's technical consultant. If the holder of an ownership interest in the proposed development is a person other than an individual, such as a corporation, partnership or trust, a statement naming the type of legal entity and listing the interest and extent of such interest of each principal in the entity. For purposes of this subparagraph, "principal" means any person or entity having a ten percent or more financial interest in the development, or if the legal entity is a trust, each beneficiary of the trust holding a ten percent or more beneficial interest in the development.
 - d. Number of lots and housing units projected to be located within the proposed development.
 - e. A copy of the proposed development's plat which will be submitted to the city, town, or county for approval or unplatted development plan and a map of the proposed development which indicates the location of the proposed water distribution system and treatment works and the proposed development's geographical coordinates.
 - f. Total acreage of and size of lots in the proposed development.
 - g. The anticipated schedule for the proposed development to reach build-out and an annual projection of water demand until build-out.
 - h. Proposed water uses of the proposed development.
 - i. Projected annual water demand per lot or housing unit within the proposed development at build-out for the following categories, and a schedule for completion of facilities associated with each category:
 - i. Single family housing units.
 - ii. Multifamily housing units.
 - iii. Non-residential uses, excluding turf-related facilities and new large cooling users.
 - iv. Turf-related facilities.
 - v. New large cooling users.
 - vi. Other uses which impact the projected annual water demand.

- j. A water supply plan.
- k. Information required to project annual lost and unaccounted for water associated with the proposed development.
- l. A description of the landscaping to be planted in public rights-of-way associated with the proposed development.
- m. Projected average number of persons per household for the proposed development for the following categories:
 - i. Single family housing units.
 - ii. Multifamily housing units.
- n. Method of distributing water to the proposed development.
- o. **A study indicating that the certificate applicant's or AAWS applicant's proposed sources of water meet the requirements established in R12-15-703 and R12-15-704. If wells proposed to provide water to the development are located within 1 mile of a WQARF or Superfund site, or if the water supply does not currently satisfy state aquifer water quality standards, the study shall include:**
 - i. **An identification of groundwater, if any, that does not meet state aquifer water quality standards within or adjacent to the wells proposed to provide water to the development.**
 - ii. **An analysis of the possible migration of groundwater that does not meet state aquifer water quality standards which may result from the proposed use.**
- p. A copy of a notice of intent to serve agreement entered into between the owner of the proposed development and a municipal provider which is proposed to serve the proposed development.
- q. A copy of any agreement for the delivery of specific sources of water to the proposed development.
- r. A copy of any water service agreement between the certificate applicant or the AAWS applicant and an active management area water district, or county water augmentation authority, or a subcontract with a multi-county water conservation district.
- s. Evidence, consistent with the requirements established in R12-15-703, of any legal right to use the proposed sources of water for the proposed development.
- t. If the municipal provider proposed to serve the proposed development is a private water company, evidence of the proposed municipal provider's certificate of convenience and necessity as approved by the Arizona Corporation Commission.
- u. Evidence of financial capability to construct the delivery system and any necessary treatment works and storage facilities for the proposed development consistent with the requirements of R12-15-707.
- v. A drought response plan, if required under R12-15-703.

- w. If the applicant qualifies as a member land of a multi-county water conservation district as provided in title 48, chapter 22, Arizona Revised Statutes, or a water district member land of an active management area water district as provided in title 48, chapter 28, Arizona Revised Statutes, evidence of such membership.
2. For an application for a designation of assured water supply, as applicable:
- a. Name of the designation of AWS applicant. If the holder of any ownership interest in the applicant is a person other than an individual, city or town such as a corporation, partnership or trust, a statement naming the type of legal entity and listing the interest and the extent of such interest of each principal in the entity.
 - b. Address and telephone number of the designation of AWS applicant and contact person.
 - c. A copy of the designation of AWS applicant's current service area map which includes the designation of AWS applicant's current and proposed distribution system, treatment works and storage facilities to be analyzed by the director in determining continuous availability under R12-15-703(C), and the designation of AWS applicant's geographical coordinates.
 - d. The designation of AWS applicant's annual population projection for each calendar year for twenty calendar years from the date of application.
 - e. An analysis of current and committed water demands for the designation of AWS applicant.
 - f. Projected water demands of the residential and non-residential use categories specified by the director which are necessary to make the determination required in R12-15-706.
 - g. A water supply plan.
 - h. Information required to project annual lost and unaccounted for water associated with the activities of the designation of AWS applicant.
 - i. Projected average number of persons per household for housing units being served and proposed to be served by the designation of AWS applicant for the following categories:
 - i. Single family housing units.
 - ii. Multifamily housing units.
 - j. **A study indicating that the designation of AWS applicant's proposed sources of water meet the requirements established in R12-15-703 and R12-15-704. If wells proposed to serve the designation of AWS applicant's service area are located within 1 mile of a WQARF or Superfund site, or if the water supply does not currently satisfy state aquifer water quality standards, the study shall include:**
 - i. **An identification of groundwater, if any, that does not meet state aquifer water quality standards within or adjacent to the wells proposed to serve the service area.**

- [illegible]

prescribed in subsection (A) of this section which is required by the director to determine physical availability under R12-15-703(B) and quality of the proposed source of water under R12-15-704. After analyzing this information, the director shall provide the applicant a written determination of the proposed source of water's physical availability and quality. The demonstration may be used by any person as evidence of the physical availability and quality of those water sources described in the demonstration.

- D. A municipal provider, other than a deemed provider, which is designated as having an assured water supply as of the effective date of this article shall file an application to continue its designation of assured water supply within 180 days after the effective date of this article or the director shall revoke the municipal provider's designation of assured water supply. If the municipal provider files an application within 180 days after the effective date of this article, and the director determines that the information is insufficient to determine whether an assured water supply exists, the municipal provider shall have sixty days from the date of notification that the application is incomplete to complete its application. If the municipal provider fails to complete its application within sixty days after receiving the notice, the director may revoke the municipal provider's designation of assured water supply.
- E. If a municipal provider is a deemed provider as of the effective date of this article, the municipal provider's designated status shall terminate as prescribed by A.R.S. § 45-576, unless the municipal provider files an application to continue its designated status on or before the date established for the termination of the deemed status and the director determines the application to be complete and correct, in which case the provider's original designation shall remain effective until the director determines whether to redesignate the provider. A deemed provider which successfully applies for redesignation under this article shall not be subject to the requirements established in this article until the provider's deemed status terminates.
- F. If a designated provider's designated status terminates, the provider may apply to be designated anytime thereafter.
- G. Subject to the provisions of subsection (H) of this section, the priority date of an application for a certificate of assured water supply, designation of assured water supply, or analysis of assured water supply shall be the date of application. In the case of two or more pending, conflicting applications for a certificate of assured water supply, designation of assured water supply, or analysis of assured water supply which the director determines to be complete and correct, priority shall be given based upon the date of application.
- H. An application which the director determines to be complete and correct for a certificate of assured water supply for a development for which a certificate of assured water supply has previously been issued, or for which a plat was recorded prior to June 12, 1980, shall have priority among pending, conflicting applications according to the date on which the prior certificate of assured water supply was issued, or the date on which the prior plat had been recorded, provided that:
 - 1. If the development has never been determined to have an assured water supply, the plat which is referenced in the application has not been substantially modified since

- the plat was recorded.
 - 2. If the development has previously been issued a certificate of assured water supply, the plat referenced in the application has not been substantially modified since the certificate of assured water supply was issued and the certificate of assured water supply has not been revoked.
- I. The owner of four or more lots which comprise a subset of a subdivision which has been platted prior to 1980 or for which a certificate has been issued is exempt from the requirement to obtain a certificate of assured water supply if both of the following conditions are met:
 - 1. The subdivision's plat has not changed since the effective date of this article.
 - 2. Water service is currently available to each lot.

R12-15-703 Assured Water Supply Requirement - Physical Availability; Continuous Availability; Legal Availability

- A. The director shall approve an application for a certificate of assured water supply or designation of assured water supply only if the director determines that the certificate applicant or designation of AWS applicant will have sufficient supplies of groundwater, surface water, or effluent which are physically available as determined under subsection (B) of this section, continuously available as determined under subsection (C) of this section and legally available under subsection (D) of this section.
- B. The director shall determine whether the applicant will have a sufficient supply of water which will be physically available to satisfy the applicant's 100 year projected water demand, if the applicant is certificate applicant, or will exceed the applicant's current and committed water demands for 100 years, if the applicant is designation of AWS applicant, in accordance with the following:
 - 1. If the proposed source is groundwater:
 - a. The director shall determine the volume of groundwater which will be available for the proposed use:
 - i. If the applicant is a designation of AWS applicant, from wells owned by the applicant which are located within the applicant's service area as indicated on the current service area map on the date of application and from proposed wells which the director determines are likely to be constructed for future uses by the designation of AWS applicant within the applicant's service area.
 - ii. If the applicant is certificate applicant, from wells which will serve the proposed development which are located within the proposed municipal provider's service area or wells which the director determines are likely to be constructed for future uses within the service area of the proposed municipal provider.
 - b. In determining the quantity of groundwater available for the proposed use, the applicant shall submit a hydrologic study using a method of analysis approved by the director which accurately describes the hydrology of the affected area.
 - c. The director shall consider groundwater to be physically available only if the groundwater is to be withdrawn from depths not to exceed the following 100 year depth-to-static water level criteria:

Location of withdrawal/type of development	Maximum 100-year depth-to-static water level
i. Phoenix, Tucson or Prescott Active Management Area/developments other than dry lot developments	1000 feet below land surface
ii. Pinal Active Management Area/developments other than dry lot developments	1100 feet below land surface
iii. For areas inside of active management areas/dry lot developments	400 feet below land surface

- d. The director shall determine the 100-year depth-to-static water level by adding:
- i. The depth-to-static water level present on the date of application for the area from which groundwater withdrawals are proposed.
 - ii. The projected declines caused by existing demand, using the projected decline in the 100-year depth-to-static water level for the area from which groundwater withdrawals are proposed to occur during the 100-year period after the date of application calculated using records of declines for the maximum period of time which records are available up to twenty-five calendar years prior to the date of application. If evidence is provided to the director of likely changes in pumpage patterns and aquifer conditions as opposed to those patterns and conditions occurring historically, the director may determine projected declines using a model rather than evidence of past declines.
 - iii. The projected decline in the depth-to-static water level for the area from which groundwater withdrawals are proposed to occur during the 100-year period after the date of application, calculated by adding the projected groundwater demand of items (1) and (2) and subtracting the projected demand of item (3):
 - (1) Committed demand.
 - (2) Other lots within developments for which the director has issued an analysis of assured water supply pursuant to R12-15-712.
 - (3) The projected demand of subdivided lots whose plats have been abandoned.

- iv. The projected decline in depth-to-static water level for the area from which groundwater withdrawals are proposed which the director projects will result from the applicant's proposed use over a 100-year period.
- 2. If the proposed source of water is surface water, other than Central Arizona Project water or Colorado River water:
 - a. The director shall determine the quantity of water annually available for the proposed use taking into consideration the priority date of the right or claim by calculating 120 percent of the firm yield of the proposed source from the point of diversion as limited by the capacity of the diversion works: except that, if the applicant demonstrates that it will use an alternative source of water which is physically available during times of shortage in the proposed surface water supply, the director shall determine the quantity of water annually available for the proposed use by calculating 100 percent of the median flow of the proposed source at the point of diversion as limited by the capacity of the diversion works.
 - b. The director shall determine the firm yield or median flow as follows:
 - i. By calculating the firm yield or median flow at the point of diversion on the basis of a minimum of twenty calendar years of flow records from the point of diversion unless twenty calendar years of records are unavailable and the director determines that a shorter period of record provides information necessary to determine the firm yield or median flow, or
 - ii. By calculating the firm yield or median flow at the point of diversion using a hydrologic model which projects the firm yield or median flow taking into account a minimum of twenty calendar years of historic river flows, changes in reservoir storage facilities and projected changes in water demand. The yield available to any applicant may be composed of rights to stored water, direct diversion or normal flow rights, or both. If the permit for the water right was issued less than five years prior to the date of application, the director shall require the applicant to submit evidence, as appropriate, in accordance with this subdivision.

R12-15-704 Assured Water Supply Requirement - Water Quality

- A. The director shall approve an application for a certificate of assured water supply or designation of assured water supply only if the applicant submits information from which the director determines that the applicant's proposed water sources will satisfy existing state water quality requirements and any other water quality standards which are effective on the date of application and which are applicable to the proposed water use after any required treatment.
- B. In making the determination described in subsection (A) of this section, the director may consider expected changes in the quality of the proposed sources of water including the migration of poor quality groundwater.
- C. The director shall establish as a condition for a designation of assured water supply that the municipal provider shall satisfy any state water quality requirements established for the applicant's proposed use after the date of designation. If the municipal provider fails to satisfy this condition, the director may terminate the designation of assured water supply after consultation with the director of the Arizona Department of Environmental Quality.

R12-15-716 Adequate Water Supply Requirement-Application for Water Report; Application for Designation of Adequate Water Supply; Application for Analysis of Adequate Water Supply

- A. A person applying for a water report, a designation of adequate water supply or an analysis of adequate water supply shall provide the following information on a form prescribed by the director:
1. For an application for a water report or an analysis of adequate water supply:
 - a. Name and address of the adequacy water report applicant or AADWS applicant.
 - b. Name of the proposed development.
 - c. Name, address and telephone number of the municipal provider proposed to serve the development, the owner of the proposed development, and the applicant's technical consultant. If the holder of an ownership interest in the proposed development is a person other than an individual, such as a corporation, partnership or trust, a statement naming the type of legal entity and listing the interest and extent of such interest of each principal in the entity. For purposes of this subparagraph, "principal" means any person or entity having a ten percent or more financial interest in the development, or if the legal entity is a trust, each beneficiary of the trust holding a ten percent or more beneficial interest in the development.
 - d. Number of lots or housing units projected to be located within the proposed development.
 - e. A copy of the proposed development's plat which will be submitted to the city, town, or county for approval or unplatted development plan, and a map of the proposed development which indicates the location of the proposed water distribution system and treatment works and the proposed development's geographical coordinates.
 - f. Total acreage of and size of lots in the proposed development.
 - g. The anticipated schedule for the proposed development to reach build-out and an annual projection of water demand until build-out.
 - h. Proposed water uses of the proposed development.
 - i. Projected annual water demand per lot or housing unit within the proposed development at build-out for the following categories, and a schedule for completion of facilities associated with each category:
 - i. Single family housing units.
 - ii. Multifamily housing units.
 - iii. Non-residential uses.
 - iv. Other uses which impact the projected annual water demand.
 - j. Information required to project annual lost and unaccounted for water associated with the proposed development.

- k. Projected average number of persons per household for the proposed development for the following categories:
 - i. Single family housing units.
 - ii. Multifamily housing units.
- l. Method of distributing water to the proposed development.
- m. **A study indicating that the adequacy water report applicant's or AADWS applicant's proposed sources of water meet the requirements established in R12-15-717 and R12-15-718. If wells proposed to provide water to the development are located within 1 mile of a WQARF or Superfund site, or if the water supply does not currently satisfy aquifer water quality standards, the study shall include:**
 - i. **An identification of groundwater, if any, that does not meet state aquifer water quality standards within or adjacent to the wells proposed to provide water to the development.**
 - ii. **An analysis of the possible migration of groundwater that does not meet state aquifer water quality standards which may result from the proposed use.**
- n. A copy of a notice of intent to serve agreement entered into between the owner of the proposed development and a municipal provider which is proposed to serve the proposed development.
- o. A copy of any agreement for the delivery of specific sources of water to the proposed development.
- p. Evidence, consistent with the requirements established in R12-15-717, of any legal right to use the proposed sources of water for the proposed development.
- q. If the municipal provider proposed to serve the proposed development is a private water company, evidence of the proposed municipal provider's certificate of convenience and necessity as approved by the Arizona Corporation Commission.
- r. A drought response plan, if required under R12-15-717.
- 2. For an application for a designation of adequate water supply, as applicable:
 - a. Name of the designation of ADWS applicant. If the holder of any ownership interest in the applicant is a person other than an individual, city or town such as a corporation, partnership or trust, a statement naming the type of legal entity and listing the interest and the extent of such interest of each principal in the entity.
 - b. Address and telephone number of the designation of ADWS applicant and contact person.
 - c. A copy of the designation of ADWS applicant's current service area map which includes the designation of ADWS applicant's current and proposed distribution system, treatment works and storage facilities to be analyzed by the director in determining continuous availability under subsection (C) of

- R12-15-703, and the designation of ADWS applicant's geographical coordinates.
- d. The designation of ADWS applicant's population projection for each calendar year for twenty calendar years from the date of application.
 - e. An analysis of current and committed water demands for the designation of ADWS applicant.
 - f. Information required to project annual lost and unaccounted for water associated with the activities of the designation of ADWS applicant.
 - g. Projected average number of persons per household for housing units for developments being served and proposed to be served by the designation of ADWS applicant for the following categories:
 - i. Single family housing units.
 - ii. Multifamily housing units.
 - h. **A study indicating that the designation of ADWS applicant's proposed sources of water meet the requirements established in R12-15-717 and R12-15-718. If wells proposed to serve the designation of ADWS applicant's service area are located within 1 mile of a WQARF or Superfund site, or if the water supply does not currently satisfy aquifer water quality standards, the study shall include:**
 - i. **An identification of groundwater, if any, that does not meet state aquifer water quality standards within or adjacent to the wells proposed to serve the service area.**
 - ii. **An analysis of the possible migration of groundwater that does not meet state aquifer water quality standards which may result from the proposed use.**
 - i. Evidence, consistent with the requirements established in R12-15-717, of the designation of ADWS applicant's legal right to use the proposed sources of water.
 - j. If the designation of ADWS applicant is a private water company, evidence of the applicant's certificate of convenience and necessity approved by the Arizona Corporation Commission.
 - k. A drought response plan, if required under R12-15-717.
3. Any other information prescribed by the director which is necessary to make a determination of whether an adequate water supply exists for the applicant.
 4. A sworn statement avowing that the information contained in the application is true and correct to the best knowledge of the adequacy water report applicant, AADWS applicant, or designation of ADWS applicant.
- B. An application for a water report, a designation of adequate water supply or an analysis of adequate water supply shall be signed by:
1. The individual owner if the proposed development or private water company is owned by a sole proprietor, or,
 2. An authorized corporate officer, partner, or trustee if the proposed development or

private water company is owned by a corporation, partnership or trust. If the application is submitted on behalf of a corporation, the application must also include a resolution enacted by the corporation which evidences that the person signing the application is so authorized by the corporation, or,

3. A city or town manager or a person in an equivalent position if the applicant is a city or town. The application shall also include a resolution of the governing body of the city or town authorizing the city or town manager to sign the application.
- C. A person applying for a physical availability demonstration shall submit evidence as prescribed in subsection (A) of this section which is required by the director to determine the physical availability under R12-15-717(B) and quality of the proposed source of water under R12-15-718. After analyzing this information, the director shall provide the applicant a written determination of the proposed source of water's physical availability and quality. The demonstration may be used by any person as evidence of the physical availability and quality of those water sources described in the demonstration.
- D. Subject to the provisions of subsection (E) of this section, the priority date of an application for a water report, designation of adequate water supply or analysis of adequate water supply shall be the date of application. In the case of two or more pending, conflicting applications for a water report, a designation of adequate water supply or an analysis of adequate water supply which the director determines to be complete and correct, priority shall be given based upon the date of application.
- E. An application which the director determines to be complete and correct for a development for which a water report has previously been issued, or for which a plat was recorded prior to May 1, 1973, shall have priority among pending, conflicting applications according to the date on which the prior water report was issued, or the date on which the prior plat had been recorded prior to June 12, 1980, provided that:
 1. If the development has never been determined to have an adequate or inadequate water supply, the plat which is referenced in the application has not been substantially modified since the plat was recorded.
 2. If the development has previously been issued a water report, the plat referenced in the application has not been substantially modified since the water report was issued.

R12-15-717 Adequate Water Supply Requirement - Physical Availability

- A. The director shall approve an application for a water report or designation of adequate water supply if the director determines that the adequacy water report applicant or designation of ADWS applicant will have sufficient supplies of groundwater, surface water or effluent which are physically available as determined under subsection (B) of this section, continuously available as determined under subsection (C) of this section and legally available under subsection (D) of this section.
- B. The director shall determine whether the applicant will have a sufficient supply of water which will be physically available to satisfy the applicant's 100 year projected water demand, if the applicant is an adequacy water report applicant, or will exceed the applicant's current and committed water demands for 100 years, if the applicant is a designation of ADWS applicant, in accordance with the following:
 - 1. If the proposed source is groundwater:
 - a. The director shall determine the volume of groundwater which will be available for the proposed use:
 - i. if the applicant is a designation of ADWS applicant, from wells owned by the applicant which are located within the applicant's service area as indicated on the current service area map on the date of application and from proposed wells which the director determines are likely to be constructed for future uses by the designation of ADWS applicant within the applicant's service area.
 - ii. If the applicant is an adequacy water report applicant, from wells which will serve the proposed development which are located within the proposed municipal provider's service area or wells which the director determines are likely to be constructed for future uses within the service area of the proposed municipal provider.
 - b. In determining the quantity of groundwater available from each well for one hundred calendar years, the applicant shall submit a hydrologic study using a method of analysis approved by the director which accurately describes the hydrology of the affected area.
 - c. The director shall consider groundwater to be physically available only if the groundwater is to be withdrawn from depths not to exceed the following 100 year depth-to-static water level criteria:

Location of withdrawal/type of development	Maximum 100-year depth-to-static water level
i. For areas outside of active management areas/developments other than dry lot developments	1200 feet below land surface
ii. For areas outside of active management areas/dry lot developments	400 feet below land surface
iii. For areas outside of active management area/dry lot developments comprised of lots with an area between 36 and 160 acres	1200 feet below land surface
iv. For areas inside of active management areas/developments comprised of lots with an area between 36 and 160 acres	1000 feet below land surface

- d. The director shall determine the 100-year depth-to-static water level by adding:
- i. The depth-to-static water level present on the date of application for the area from which groundwater withdrawals are proposed.
 - ii. The projected declines caused by existing demand, using the projected decline in the 100 year depth-to-static water level for the area from which groundwater withdrawals are proposed to occur during the 100 year period after the date of application, calculated using records of declines for the maximum period of time for which records are available up to twenty-five calendar years prior to the date of application. If evidence is provided to the director of likely changes in pumpage patterns and aquifer conditions as opposed to those patterns and conditions occurring historically, the director may determine projected declines using a model rather than evidence.

- iii. The projected decline in the depth-to-static water level for the area from which groundwater withdrawals are proposed to occur during the 100-year period after the date of application, calculated by adding the projected groundwater demand of items (1) and (2) and subtracting the projected demand of item (3):
 - (1) Committed demand.
 - (2) Other lots within developments for which the director has issued an analysis of adequate water supply pursuant to R12-15-723.
 - (3) The projected demand of subdivided lots whose plats have been abandoned.
 - iv. The projected decline in depth-to-static water level for the area from which groundwater withdrawals are proposed which the director projects will result from the applicant's proposed use over a 100-year period.
 - e. The director may lower the 100-year depth-to-static water level requirement specified in subparagraph (c) of this paragraph, if the director determines that groundwater is available at the lower depth and the applicant demonstrates the financial capability to obtain the groundwater.
- 2. If the proposed source of water is surface water, other than Central Arizona Project water or Colorado River water:
 - a. The director shall determine the quantity of water annually available for the proposed use taking into consideration the priority date of the right or claim by calculating 120 percent of the firm yield of the proposed source from the point of diversion as limited by the capacity of the diversion works; except that, if the applicant demonstrates that it will use an alternative source of water which is physically available during times of shortage in the proposed surface water supply, the director shall determine the quantity of water annually available for the proposed use by calculating 100 percent of the median flow of the proposed source at the point of diversion as limited by the capacity of the diversion works.
 - b. The director shall determine the firm yield or median flow as follows:
 - i. By calculating the firm yield or median flow at the point of diversion on the basis of a minimum of twenty calendar years of flow records from the point of diversion unless twenty calendar years of records are unavailable and the director determines that a shorter period of record provides information necessary to determine the firm yield or median flow, or
 - ii. By calculating the firm yield or median flow at the point of diversion using a hydrologic model which projects the firm yield or median flow taking in account a minimum of twenty calendar years of

historic river flows, changes in reservoir storage facilities and projected changes in water demand. The yield available to any applicant may be composed of rights to stored water, direct diversion or normal flow rights, or both. If the permit for the water right was issued less than five years prior to the date of application, the director shall require the applicant to submit evidence in accordance with this subdivision.

R12-15-718 Adequate Water Supply Requirement - Water Quality

- A. The director shall approve an application for a water report of designation of adequate water supply only if the applicant submits information from which the director determines that the applicant's proposed water sources will satisfy existing state water quality requirements and any other water quality standards which are effective on the date of application and which are applicable to the proposed water use after any required treatment.
- B. In making the determination described in subsection (A) of this section, the director may consider expected changes in the quality of the proposed sources of water, including the migration of poor quality groundwater.
- C. The director shall establish as a condition for a designation of adequate water supply that the municipal provider shall satisfy any state water quality requirements established for the applicant's proposed use after the date of designation. If the municipal provider fails to satisfy this condition, the director may terminate the designation of adequate water supply after consultation with the director of the Arizona Department of Environmental Quality.